

CHOLECYSTECTOMY *VERSUS* REMOVAL OF THE MUCOUS MEMBRANE OF THE GALL-BLADDER.

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IN the development of surgical work on gall-stones in the gall-bladder, three epochs have been passed through which may be differentiated by the principles dominating the operator's mind and guiding his hand. The first epoch was characterized by the idea that these stones themselves are the cause of all the trouble, and, therefore, their removal alone was the aim of the operation, and the sooner the gall-bladder was closed, the more successful the operation was thought to be. Cholecystendysis, the so-called ideal operation, seemed to fulfil the requirements; to-day, it is practically abandoned. It soon became clear that there was a second factor of supreme dignity in the pathology of cholelithiasis, the diseased mucous membrane of the bile tract.

Cholecystostomy, the operation of opening the gall-bladder and leaving it open for the purpose of drainage and local treatment of the gall-bladder and ducts, then was considered the supreme remedy. As, however, the reports of biliary and mucous fistulæ, of stones overlooked or reformed, of strictures and inflammatory processes accumulated, a further step was taken, and the removal of the entire gall-bladder with the cystic duct, or cholecystectomy, entered into competition with the older methods.

The removal of the gall-bladder is, as a rule, neither a difficult nor a dangerous operation. Kehr,¹ for instance, reports, in over 100 operations of this kind, a mortality of about

3 per cent.; he has frequently performed the operation in one-half hour. He declares that he is performing this operation at present more frequently than any other gall-stone operation, and that he is better satisfied with the remote results from this procedure than from any other rival operation. This latest and most radical operation on the gall-bladder is, of course, unanimously recommended by all surgeons in cases where the gall-bladder is the seat of malignant or such acute inflammatory or necrosing processes as make its preservation an impossibility. In cases of chronic inflammation, however, where the gall-bladder is thickened, where it is small, where it may or may not contain stones or sand, where it is adherent to neighboring organs, cholecystectomy is only one of several operations that will come under consideration.

We do not think that cholecystenterostomy, the formation of an anastomosis between the gall-bladder and some convenient portion of the bowel, is to be discussed here as a competing operation, because this procedure is often difficult of performance in this particular instance, and appears uncertain in its outcome because it would seem to favor infection of the bile tract. Two other methods, however, have attracted considerable attention in the treatment of these contracted gall-bladders. One, the drainage by a tube inserted into the gall-bladder and made water-tight after suturing the gall-bladder opening around it (Kehr,¹ Poppert,¹ Mayo²), and the other, Mayo's method^{2, 3} of removal of the mucous membrane of the gall-bladder.

The first operation of the water-tight insertion of a rubber tube into the gall-bladder is good enough in an emergency, if the operation is a tedious one on account of complications, adhesions, etc., but just in such cases secondary operations are quite frequently required. Mayo³ describes this condition most admirably in the following words: "After the removal of the external drainage, the thickened walls of the gall-bladder continue to contract, interfering with the drainage through the ducts from the islands of mucous membrane not previously destroyed, and a condition results resembling a chronic ap-

pendicitis in many aspects." He recommends cholecystectomy in such cases, and therein agrees with the majority of surgeons. Mayo² offers, as a substitute for the cholecystectomy, the removal of the mucous membrane of the gall-bladder. "Especially," says he, "is it as a secondary operation that the removal of the mucous membrane is most serviceable; that is to say, where a cholecystostomy has been performed without accomplishing the desired results."

This removal of the mucous membrane, according to Mayo, is done by pulling it from the underlying tissues, and is said to be easily performed. The hæmorrhage is insignificant, and requires, at the worst, one or two ligatures, or the twisting of some small vessels. After the removal of the mucous membrane, the cystic duct is ligated, and drainage is carried down through the remaining muscular and connective-tissue coats of the gall-bladder to the stump of the cystic duct. Mayo and others have performed the operation with good results.

Some observations in the surgical pathology of the gall-bladder which I have recently made have convinced me that this operation of removal of the mucous membrane of the gall-bladder is subject to serious objections, which I think ought not to be overlooked. The case on which these observations have been made is the following:

Mrs. L., forty-five years old, has passed gall-stones several times, first, eighteen years ago, then two years ago, then for several months before I operated. The stones have been from the size of a hazel-nut down to very small concretions. She has never had jaundice, but severe colics have preceded the passage of stones every time. For the past two years the patient has not been entirely free from pain at any time. She was not jaundiced when I first saw her. The region of the gall-bladder was painful on pressure; otherwise, examination had negative result.

The operation revealed a small, hard gall-bladder low down, adherent to the omentum, colon, and duodenum near the pylorus. It was dissected out from its adhesions and from the liver, the cystic duct tied off with catgut close to the common duct, and

the gall-bladder was removed. On opening it, five small stones and a quantity of sand were discovered in the gall-bladder. The cystic duct was closed by inversion of its walls, a piece of omentum was sutured over the stump, and a strip of gauze passed down to the stump. After covering all raw surfaces of the bowel by sero-serous sutures, the abdomen was closed, with the exception of a small opening through which the gauze was permitted to protrude. The patient made a good recovery, and left the hospital eighteen days after operation in very good health, and the wound closed with the exception of a very small, granulating portion of the skin, which has closed since. The operation was done in January of this year, and I have heard from the patient since then; she is in excellent health.

The most important feature of the case was the examination of the removed gall-bladder. The wall of the gall-bladder was six millimetres thick. Of this, about one millimetre is muscular coat and mucous membrane; the rest is connective cicatricial tissue and serous coat. The thickness of the muscular coat is about four times that of the mucous membrane. The mucous membrane is covered with the normal columnar epithelium of the gall-bladder, and the glands of the mucous membrane show secreting epithelium. Between the glands of the mucous membrane, foci of round-cell infiltration are to be seen which penetrate the muscular coat following the blood-vessels. The most important finding concerning the glands is that they penetrate the muscular coat so that their fundus appears beyond the external surface of the muscular coat and is embedded in the connective tissue of the subserous portion. These glands are invested with apparently perfectly normal columnar epithelium; there is no multiplication of layers, there is no atypical arrangement, and there is no metaplasia of the cells. The subserous, thickened, cicatricial tissue contains occasional foci of round-cell infiltration, but these remnants of inflammation are few and far between. The serous coat presents nothing abnormal.

Leaving out of consideration all other features of this pathologic condition, the most important observations have



Wall of removed gall-bladder.—M, mucous membrane; G, gland penetrating muscular coat; Msc, muscular coat; S, serosa.

been made on the glandular elements of this gall-bladder. We find that the glands, instead of being confined to the mucous membrane, penetrate the muscular layer and appear between this and the serosa. We have to deal with abnormal growths of the glands, as we see it occasionally also in other organs composed of mucous membrane and muscular wall, as, for instance, the uterus and stomach. It is not too much to say that here is morphologically the connecting link between the benign hypertrophy and the malignant, destructive growth.

Now, as to the surgical significance of the case, it is very evident that, in attempting to remove the mucous membrane of this gall-bladder, an operator would undoubtedly have removed muscularis with the mucosa, so that, in attempting the removal of the mucosa alone, he would have removed more than he intended to remove. Furthermore, it is evident that if, instead of removing the whole gall-bladder, Mayo's operation of removing the mucous membrane alone had been performed, glandular elements would have been left behind in the remaining wall of the gall-bladder, and what would have been the outcome? The outcome would have been just what Mayo correctly describes as above quoted: "Islands of mucous membrane not destroyed by the operation would have continued to secrete; a condition much resembling chronic appendicitis" would have been created artificially and the result of the operation would probably have been a disappointment.

It is perfectly true that in the operations performed by Mayo and others no bad results have been reported, but the time during which this operation has been done is short, and the number of cases is not large as yet. On the other hand, we have most excellent clinical and experimental evidence with which to support our contention that the danger from such remaining glands is more than imaginary or theoretical. First of all, we know, by the experiments of Oddi⁴ and those of Voogt,⁵ that after the removal of the gall-bladder the remaining mucous membrane of the cystic duct grows abundantly, so as to give rise to a sort of new gall-bladder, and the mucous membrane of the cystic duct is genetically and his-

tologically the same as that of the gall-bladder. Therefore, remnants of glands left behind might give rise to cystic formations. Second, unintentionally similar experiments have been made clinically on an organ constructed on similar lines,—the uterus. It has been observed here that, after unwise curettement of the uterus, part of the uterus became obliterated, proving what destruction of mucous membrane in that part of the uterus would do; while behind the destruction a hydrometra formed, the contents being produced by the patches or islands of mucous membrane reproduced from the ends of glands left in the depth between the muscular fibres in the same way as a pulling off of the mucous membrane of the gall-bladder would have done in the above case. In the course of severe inflammatory processes of the uterine mucosa, a similar result has been observed after partial necrotic destruction of the mucous membrane.

We, therefore, have to take into account the possibility of the formation of a retention tumor in the remnant of the gall-bladder after apparently complete removal of the mucous membrane. Such a retention tumor would have the same pathology and clinical dignity as a hydrops of the gall-bladder due to stricture of the cystic duct, a condition that is best treated by cholecystectomy.

My conclusion, therefore, is that the removal of the mucous membrane of the gall-bladder is a step in the wrong direction, and ought to be abandoned in favor of the more radical, more reliable, and hardly more dangerous cholecystectomy.

LITERATURE.

¹ Kehr: *Münchener medicinische Wochenschrift*, February, 1900.

² Mayo: *Journal of the American Medical Association*, 1900.

³ Mayo: *ANNALS OF SURGERY*, 1899.

⁴ Oddi: Quoted after Voogt.

⁵ *Centralblatt für Chirurgie*, November, 1898.